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eral years in succession. It is more destructive on high prairie land than low land, in dry seasons than in wet seasons. On the bottom farms mentioned, the damage was in spots where the soil was exceptionally loose. No artificial remedies have been used in this vicinity.

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#### ON THE HORSE FLIES OF NEW MEXICO AND ARIZONA.

BY C. H. TYLER TOWNSEND, NEW MEXICO AGRICULTURAL COLLEGE, LAS CRUCES, N. M.

Horse flies rarely occur on the higher lands or mesas of New Mexico and Arizona, so far as my experience goes, unless in proximity to some swale, spring, or body of water. They are met with in valleys of rivers and streams, and some species occur very abundantly in the neighborhood of isolated swales or marshy places filled with a growth of tall grass or various plants. Such swales occur at long distances from each other in some parts of this region, as in eastern-central Arizona, and may or may not be situated near to a creek or spring. They are usually filled with the carcasses of dead cattle, which have been unfortunate enough to get mired in them, and in such cases yield a most offensive odor.

This distribution of the horse flies is the result of the nature of the country, where water holes and springs are few and far between. It is quite possible that most of the species breed in these swales, but doubtless the prime reason for their occurrence near water is because the animals whose blood they suck are to be found there only.

The following species have been collected by the writer in this region:

- Chrysops fulvaster* O. S. ♂ ♀  
*Silvius quadrivittatus* Say. ♂ ♀  
*Apatolestes comastes* Will. ♀  
*Diachlorus guttatulus* n. sp. ♀  
*Tabanus punctifer* O. S. ♂ ♀  
*Tabanus lineola* Fab. ♂ ♀  
? *Tabanus vivax* O. S. ♀

Below are given notes and descriptions of the species:

*Chrysops fulvaster* Osten Sacken.—Seven ♀ specimens and one ♂ from G bar ranch, Zuni river, Arizona, July 27 (Apache county). One ♀ from Pescado, N. M., July 31 (Valencia county). One ♀ from Springerville, Ariz., June 24 (Apache county). Seven ♀♀ from Seneca ranch, north of Springerville, Ariz., June 25 (Apache county). Most of my ♀ specimens are 8 mm. in length; the one ♂ is 7 mm. In the ♂ the "subhyaline elongated spot at the distal end of both basal cells," mentioned in Osten Sacken's description, extends into and occupies the central third of the anal cell. There is also present the subhyaline spot in the middle of the fifth posterior cell, as in the ♀; and the crescent-shaped space toward the apex of the wings, mentioned by Osten Sacken, also present in the ♀. The discal cell is faintly subhyaline in its central portion. With these exceptions, the wing of the ♂ is wholly blackish, if we except a minute subhyaline spot in the extreme proximal end of the first basal cell. Osten Sacken does not mention the antennae, which are wholly black in the ♂, but blackish with the first joint fulvous or reddish in the ♀. Williston has noticed the swollen first antennal joint, peculiar to this species (Trans. Kas. Acad. Sci., vol. X, p. 134). This species is very annoying to man and horses. It was found very abundantly at a slough near the Seneca ranch, about a half mile south; the slough grassy, and full of reeds and dead cattle. The flies were very bloodthirsty. One was found piercing one of the leather girth straps of my saddle, and another at-

tempted to pierce my heavy overalls. They will fly in one's face, and bite almost the moment they have alighted. They were also extremely numerous at a swale near the G bar ranch, on the Zuni river.

*Silvius quadrivittatus* Say.—I identify numerous specimens from Las Cruces, N. M., as this species. They are all females, taken from June 10 to September 2. My specimens are from  $6\frac{1}{2}$  to nearly 9 mm. Say's description gives nearly  $\frac{2}{3}$  inch (nearly 10 mm.). In some of the specimens the dorsum of the abdomen is more or less tinged with yellowish, but nearly all have the abdomen uniform silvery cinereous, except the four longitudinal series of brown spots. Say's description was probably from one or more specimens possessing the yellowish tinge. This species is often very troublesome to horses in the Mesilla valley (vicinity of Las Cruces, Doña Ana county, N. M.) It does not seem to attack man in this locality. It was not met with during a trip through northeastern Arizona the past summer. A ♂ specimen, which was taken on flowers near Sabinal, N. M., August 7 (Socorro county), I take to be the ♂ of this species. It differs as follows from the ♀: Only two black facial tubercles, the intermediate third one absent; first antennal joint pale fulvous at base; palpi very small, much shorter than in ♀, very pale fulvous; thorax with a very slight fulvous tinge; abdomen yellowish or orange, more deeply yellow on hind margins of segments, first two segments more silvery; brown markings of abdomen a little heavier; pleuræ, sternum and venter less silvery pollinose.

*Apatolestes comastes* Williston.—One ♀ specimen taken at Manguitos Springs, N. M., (Socorro county, near the Arizona line,) June 23, I believe belongs to this species. It agrees perfectly with Williston's generic description, and differs from the specific description only as follows: Palpi grayish; tibiae brown or blackish. While the first segment and the hind margins of the other segments of the abdomen may be grayish or brownish gray, and clothed with sparse whitish hairs, the most of the abdomen is clothed with black hairs. The length is same—11 mm.; wing, 9 mm.

*Diachlorus guttatus* n. sp.—Female: Face short, whitish, clothed with pure white hair, without callosities; front quite distinctly convergent anteriorly, yellowish gray pollinose showing more thickly above base of antennæ; frontal callosity black, nearly square, prolonged above in the middle and at each side, the lateral prolongations often cut off, sometimes irregular; an ocellar callosity black, not raised into a tubercle. Antennæ inserted well below middle of head, light brownish, annulated portion of third joint black, the third joint at base having no distinct upper angle. Palpi large, almost as long as proboscis, yellowish white, with very few black hairs. Thorax cinereous, with six longitudinal blackish lines, the outermost one on each side less distinct than the others; sternum and pleuræ clothed with white hair. Abdomen silvery gray pollinose, sometimes with more or less of a yellowish-red tinge, especially on the sides of second to fourth segments; first segment with a posterior transverse submarginal narrow brown band, more or less interrupted in the middle; second with an anterior marginal transverse brown band, thickened in middle, but split from behind so as nearly to be interrupted; segments three to five also showing an anterior brown margin, at least in middle; segments two to six with four posterior submarginal brown spots, those on fifth and sixth segments usually not quite so distinct, spots rarely coalescing. Wings entirely hyaline, stigma very faintly if at all yellowish; all the posterior cells widely open, anterior branch of third vein with quite a long stump near origin. Legs brownish yellow, front femora slightly darker at tip; front tarsi and tips of front tibiae black, tips of other tarsi brownish; front tibiae slightly enlarged distally. Length, 9 to 10 mm.; of wing, 8 to 9 mm. Described from seven ♀ specimens, Las Cruces, N. M., June 26 to 29. I have referred this to the genus *Diachlorus* on account of the short face and somewhat swollen front tibiae, though the face has no callosities, and the eyes, as revived over wet sand,

do not show the very oblique, nearly vertical stripes mentioned by Osten Sacken (Prod. Mon. Tabanidæ, vol. I, p. 396), but have them nearly horizontal. The arrangement of the bands is as follows: Eyes green, with four slightly oblique purplish-bronze bands, the lowermost one forming the lower border of the eye, and the uppermost one being some distance from the upper angle of the eye.

*Tabanus punctifer* Osten Sacken.—This is a large black species, with a tan-colored thorax, which is found more commonly throughout this region. It attacks horses and cattle. One ♀, Las Cruces, N. M., June 9; one ♀, Fort Selden, N. M., June 13 (Doña Aña county); two ♀, La Vega de San José, N. M., August 4 (Valencia county); one ♂, Chaves, N. M., August 6 (Valencia county); also, one ♂, Grand Cañon of the Colorado river, Arizona, Hance trail, about 4,000 feet below rim of cañon, July 11 (Yavapai county).

*Tabanus lineola* Fab.—Four ♀, Las Cruces, N. M., May 20 to June 4; and one ♂, Las Cruces, N. M., May 23. This species is quite frequently found on horses here.

*Tabanus vivax* Osten Sacken.—One ♀, taken in the Grand Cañon, Hance trail, about 4,000 or 5,000 feet below rim, July 11 (Yavapai county), agrees very well with Osten Sacken's description of the ♂ of this species (the ♀ is not described). (See Prod. Mon. Tabanidæ, vol. II, p. 446.) It is only 12 mm. in length, and may be a distinct species; but I do not feel competent to decide on this point without more material. The palpi are whitish rather than reddish, and the bases of the tibiæ are rather yellowish than reddish. The frontal callosity is rounded in outline above, very black, and polished; the face is short, the antennæ being inserted low; the eyes, revived over wet sand, are purplish, with two almost horizontal green bands but little below middle of eye, the upper angle of eyes blackish; or, the eyes may be described as having two green and three purplish bands, the lowermost purplish band forming the lower border of the eye, and the uppermost purplish band bordering the black, upper angle.

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#### ON A PECULIAR ACALYPTRATE MUSCID FOUND NEAR TURKEY TANKS, ARIZONA.

BY C. H. TYLER TOWNSEND.

While on a trip by wagon the past summer to the Grand Cañon of the Colorado river, a peculiar dipterous insect was met with in numbers, July 1, in a certain restricted locality, a few miles west of Turkey Tanks, Ariz., on the road to Flagstaff. The insects were found somewhere near the center of a large open stretch of meadow-like country, probably about three or four miles from the Tanks, and about 10 miles from Flagstaff. They were evidently flying, as they came in the wagon, alighting on whatever they happened to strike. The locality is probably about five or six miles east of the base of the San Francisco mountains. They occurred for some distance as we drove along the road, probably for a mile or so, and not a specimen was seen at any other place during the whole trip, comprising a drive of over 1,200 miles through southwestern New Mexico and northeastern Arizona. The more remarkable thing concerning this occurrence is, that on our return, while traveling along the same road, July 17, we found the same fly in numbers coming in the wagon at, as nearly as I can say, the very same place along the road. In neither case did I get out of the wagon to capture specimens, as I was able to take plenty of them without this trouble.

The species is very striking in appearance, being of a narrow, elongate form, with very long, slim legs, and an elongate, anteriorly-produced head. These pecu-